

Geometry Date_____ 2.3 Assignment Deductive Reasoning (pp 87–90)

1. What is your name?

Using p and q , write the symbolic statement in words. Assume p and q are true. Decide if each symbolic statement is true or false.

p : The value of x is -4 . q : $3x + 2 = -10$

2. $\sim q$

$$3x + 2 \neq -10$$

3. $q \text{ ® } p$

$$\text{If } 3x + 2 = -10 \text{ then } x = -4$$

4. $p \text{ ® } q$

$$\text{If } x = -4, \text{ then } 3x + 2 = -10.$$

5. $\sim p \text{ ® } \sim q$

$$\text{If } x \neq -4, \text{ then } 3x + 2 \neq -10.$$

Determine if statement (3) follows from statements (1) and (2) by the Law of Detachment or the Law of Syllogism. If it does, state which law was used. If it does not, write invalid.

6. (1) If the lines are perpendicular, then they intersect to form a right angle.

(2) Line l is perpendicular to line m .

(3) Lines l and m intersect to form a right angle.

Law of Detachment

7. (1) If the quadrilateral is a square, then it has four right angles.

(2) Quadrilateral $ABCD$ has four right angles.

(3) Quadrilateral $ABCD$ is a square.

Invalid

8. (1) If you practice your clarinet, then you will improve.

(2) Kevin practices his clarinet.

(3) Kevin's clarinet playing improves.

Detachment

9. (1) If $m\angle 2 \neq 40^\circ$, then $m\angle 3 \neq 140^\circ$.

(2) If $m\angle 3 \neq 140^\circ$, then $m\angle 4 = 40^\circ$.

(3) If $m\angle 2 \neq 40^\circ$, then $m\angle 4 = 40^\circ$.

Syllogism

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Assume the following statements are true.

- If I call the superintendent, then I must pay the rent. ($p \Rightarrow q$)
- If the apartment ceiling is not leaking, then it is not raining. ($\sim r \Rightarrow \sim s$)
- I will call the superintendent if the apartment ceiling leaks. ($r \Rightarrow p$)
- If it is not raining, then it is not Tuesday. ($\sim s \Rightarrow \sim t$)

10. Write the contrapositive of the second statement.

If it is raining, then the apartment ceiling is leaking

11. Write the contrapositive of the fourth statement.

If it is Tuesday, then it is raining

12. Write the premises in an order which makes a valid argument. (What proposition should you start?)

It is Tuesday

13. It is Tuesday. Can you conclude that you must pay the rent? Explain.

yes,

Law of syllogism,

14. It is not Tuesday. Can you conclude you did not pay the rent? Explain.

No. Doesn't follow the syllogism.

Review.

Use the diagram to name a point. (Chapter 1 Section 2)

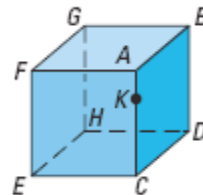
15. A third point collinear with A and C.

K

16. A fourth point coplanar with A, C, and E.

17. A point coplanar with A and B, but not coplanar with A, B, and C

18. A point coplanar with A and C, but not coplanar with E and F



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Find $m\angle ABD$ given that $\angle ABC$ and $\angle CBD$ are adjacent angles. (Chapter 1
Section 4)

19. $m\angle ABC = 20^\circ$; $m\angle CBD = 10^\circ$

30°

20. $m\angle CBD = 13^\circ$; $m\angle ABC = 28^\circ$

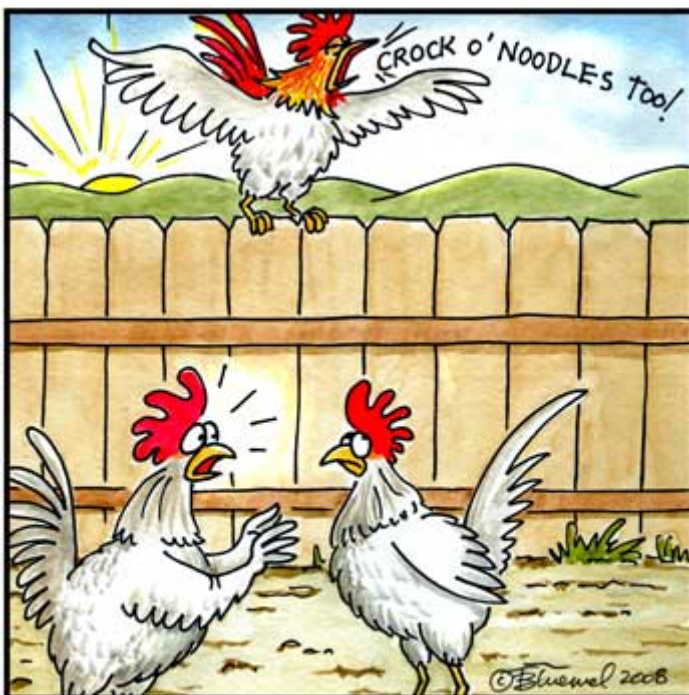
41°

21. $m\angle ABC = 3y + 1$; $m\angle CBD = 12 - y$

$2y + 13$

22. $m\angle CBD = 11 + 2f - g$; $m\angle ABC = 5g - 4 + f$

$3f + 4g + 7$



"Think about it, Stan - if the sky isn't falling, why is the dawn cracking?!"